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Analgesics Self-Medication and Its Effects on Sleep Quality: Among Medical Students in Peshawar.

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ABSTRACT

Background: Medical students are commonly seen engaging in self-medication with analgesics due to the pressure and load of studies, availability of medicines, knowledge of common medicines and avoidance of seeking medical help for minor symptoms. Analgesic medication can help alleviate headache, body pain, fever, menstrual pain and stress-related pain but unsupervised use can lead to inappropriate use of medication and can be indicative of lifestyle or health related issues. Poor sleep may also impair concentration, memory, academic achievement, mood, and overall health, which are other issues that medical students want to focus on.

Objective: To determine the frequency of analgesic self-medication and assess its association with sleep quality among medical students in Peshawar.

Methods: The study was of a cross sectional design conducted in four medical colleges located in public and private sector of Peshawar (two public and two private sector medical colleges) and included undergraduate medical students. There were a total of 404 medical students included. Structured self-administered questionnaire was used to gather data. Analgesic self-medication was defined as past month use of analgesics without a prescription from a doctor. Sleep quality was assessed as very good, fairly good, fairly bad, very bad. The frequencies and percentages were computed and Chi square test used for analyzing Data. Statistically significant was defined as a p-value of ≤ 0.05.

Results: Out of 404 students, 238 (58.9%) reported using analgesics without a medical prescription during the past month, while 166 (41.1%) did not report analgesic self-medication. Among students who practiced analgesic self-medication, 59 (24.8%) reported very good sleep quality, 125 (52.5%) fairly good, 35 (14.7%) fairly bad, and 19 (8.0%) very bad sleep quality. Among non-users, 52 (31.3%) reported very good sleep quality, 75 (45.2%) fairly good, 27 (16.3%) fairly bad, and 12 (7.2%) very bad sleep quality. The association between analgesic self-medication and sleep quality was statistically non-significant ($p = 0.422$).

Conclusion: Analgesic self-medication was common among medical students in Peshawar; however, it was not significantly associated with sleep quality. The findings suggest that sleep quality among medical students may be influenced by other academic, psychological, and lifestyle-related factors. Awareness regarding rational analgesic use and healthy sleep practices should be promoted among medical students.

Keywords: *Analgesics, self-medication, sleep quality, medical students, Peshawar.*

INTRODUCTION

Self-medication is the use of medicines by someone to treat symptoms he/she has identified, without the advice of a trained

health worker. This involves self-administration of prescription medication, utilization of unused prescription, repetition of previously prescribed medications, or self-administration of prescription medication as recommended by peers, family members and friends. Self-medication though it may seem convenient may turn out to be harmful if medicines are taken incorrectly, frequently or without knowledge of correct dose, duration, contraindications and adverse effects (1-3).

Analgesics are one of the most frequently used medicines for self-medication. They are used to treat headaches, fever, bodyaches, menstrual pain, dental pain, musculoskeletal pain and stress. Numerous analgesics are readily available without prescription, making it more likely they will be used without supervision. Analgesics commonly used in the clinic, including non-steroidal anti-inflammatory drugs and paracetamol, may be safe if used properly, but may cause gastritis, gastrointestinal bleeding, renal impairment, hepatotoxicity, allergic reactions and can disguise a serious underlying disease if used irrationally or in excess (4-6).

Self-medication is a special case among medical students. They have a fundamental understanding of pharmacology, exposure to clinical environments, easy access to medicines and confidence in managing minor illness, which may lead to them having an increased tendency to self-medicate. Medical students are also burdened with a rigorous academic schedule, multiple tests, extensive time spent studying, clinical duties and psychological pressure. These factors can both play a role in the use of analgesics and in the sleep disturbances. Hence, it is noteworthy to study self medication effect of analgesics among medical students as they are future health care givers and their present analgesic use may affect their future drug prescription (7, 8).

Good sleep is a key aspect of a healthy body and mind. To ensure a good sleep, the memory consolidation, learning, emotional regulation, immune function and daily performance would be dependent. Sleep problems have been linked to fatigue, decreased attention, moodiness, anxiety, decreased performance on school assignments, and lowered quality of life for medical students. Poor sleep is especially prevalent among medical students due to academic burden, examination pressure, non-standard working hours, the use of screens, consumption of caffeine, and late-night studying (9).

The possible relationship between analgesic self-medication and sleep quality is important to explore. Certain students may take analgesics due to the pain or discomfort that would interfere with his/her sleep and some may not sleep well due to stress, unhealthy lifestyle and frequent use of medicines. In other cases, self-medication for pain may not directly impact sleep quality but may represent underlying physical or psychological stressors that could affect sleep quality. Thus, if both self-medication for pain and sleep quality are measured, it can be determined whether or not these two are related in medical students (10).

Self-medication is also prevalent in Pakistan because medicines are easily available, over-the-counter drugs are available, less consultation during minor illnesses and strict control on medicine dispensing is not observed. This may be more common among medical students because of the familiarity with the names and indications of drugs. But, there is limited local evidence on the links between self-medication of analgesics and sleep quality among medical students of Peshawar. Existing research has concentrated on either self-medication in general or sleep quality alone, with fewer studies exploring the relationship between the two.

Therefore, the present study was conducted to determine the frequency of analgesic self-medication and to assess its association with sleep quality among medical students in Peshawar. The findings may help in understanding medication-related behavior among future doctors and may support the need for educational interventions on rational drug use, safe analgesic practices, and healthy sleep habits in medical colleges.

METHODOLOGY

This study was conducted as a cross-sectional analytical study to determine the frequency of analgesic self-medication and to assess its association with sleep quality among medical students in Peshawar. A cross-sectional design was selected because the study aimed to collect information regarding analgesic use and sleep quality at a single point in time without any intervention or follow-up. The study focused on undergraduate medical students because this group is commonly exposed to academic pressure, long study hours, examinations, and easy access to medical knowledge, which may influence both self-medication practices and sleep patterns.

The study was conducted in four medical colleges out of which two medical colleges were public sector and two were private sector of Peshawar. The institutions selected were Jinnah Medical College, Northwest School of Medicine, Khyber Medical College, and Khyber Girls Medical College. These institutions have been added to get feedback from students studying in different academic settings, and to enhance medical student representation from public and private medical colleges. The population studied comprised of the students pursuing the undergraduate course of MBBS in the selected medical colleges during the study period. As stated in the shared abstract, the total number of students in the sample was 404 medical students.

The sample size of 404 was considered for good representation of medical students and to determine the pattern of self-medication of analgesics and sleep quality with reasonable accuracy. Non-probability sampling (Convenient sampling technique) was used because the data were collected from the available and willing medical students of the selected colleges.

An attempt was made to include more students by approaching students from different year levels. The students were thoroughly briefed on the purpose of the study before the questionnaire was given to them and only those who agreed with the purpose of the study were included.

All undergraduate medical students from the selected institutions who were present at the time of data collection and gave informed consent were included in the study. Students who declined to participate, were not in the classroom for data collection, returned incomplete questionnaires or could not provide the information were removed. Those students taking analgesics for a chronic medical condition prescribed by their doctor were also excluded where possible, as the study was only looking at students taking analgesics without a valid doctor's prescription, since the study was primarily concerned with analgesic taking without medical prescription.

A structured questionnaire was used to gather data, which was administered as a self-administered questionnaire. The questionnaire was constructed to gather data on demographic information, sleep quality and analgesic self-medication. The first part contained basic demographic data including age, gender, academic year, type of medical college. The second section evaluated the use of analgesics for self-treatment and if the student had taken medicines for pain without a prescription from a doctor in the last month. A student was considered to be engaged in analgesic self-medication if he or she reported using analgesics without a prescription, and non-users if he or she did not use analgesics without a prescription in the last month.

The questionnaire also focused on aspects of the use of analgesics including the possible use of an analgesic, how often the analgesic was taken, the reason for taking analgesics and who advised them to take them. These are usually headache, aches, menstrual ache, fever, dental pain or pain due to stress. The principle variable in this primary analysis was, however, the past month use of analgesics for self-medication, yes or no. The classification was made to make a comparison of sleep quality among students who used analgetics for self-medication with students who did not use self-medicating drugs.

Direct self-reported sleep quality question was used for assessing sleep quality. Recently students were asked to evaluate their sleep quality in the last few days on a four-point scale (very good, fairly good, fairly bad, and very bad). To explain the distribution of sleep quality, these four categories were preserved to reflect the self-medication of analgesics in students and the distribution of the sleep quality in those groups. Further grouping analysis was conducted according to sleep quality, good sleep quality and poor sleep quality. Students who reported very good or fairly good sleep quality were classified as having good sleep quality, and students who reported fairly bad or very bad sleep quality were classified as having poor sleep quality.

The primary independent variable of the study was defined as ‘analgesic self-medication' (use of any type of analgesic drug without the advice or prescription of a registered medical practitioner in the last month). Sleep quality, as self-reported sleep quality categories, was the main dependent variable. Other variables were age, sex, academic year, type of college, why the analgesic was being taken and how often the analgesic was taken (if applicable on the questionnaire). These variables were used to describe the study population and for the context of interpreting the findings of drug use and sleep.

Before starting data collection, permission was obtained from the concerned authorities of the selected medical colleges. Ethical considerations were adhered to during the study. The study was conducted in a non-compulsory manner and the students were told that the study was voluntary and that they could refuse to participate without any academic or personal repercussions. Questionnaire completed with verbal and/or written informed consent. Avoiding the use of names, roll numbers and/or personal identifiers on the questionnaire ensured confidentiality and anonymity. The data gathered was only used for research.

Analgesic self-medication and sleep quality were measured on a categorical scale and the chi-square test was used to examine the association between the two factors. A preliminary analysis of sleep quality was conducted in four categories: very good, fairly good, fairly bad, and very bad. A regrouped analysis was conducted as well, in which very good and fairly good were combined as good and fairly bad and very bad as poor sleep quality. The p-value value was defined as statistically significant when it is ≤ 0.05. The correlation between the use of self-medication of analgesics and sleep quality in the present study was not statistically significant, meaning that there was no significant difference between students who used analgesics for self-medication and students who did not use analgesics for self-medication in sleep quality.

RESULTS

In total 404 medical students from selected medical colleges of Peshawar were included in the study. Of these, 238 students (58.9%) said they used analgesics without a proper medical prescription in the past month, and 166 students (41.1%) said they didn't use any analgesics without a proper medical prescription in the past month.

Table 1. Frequency of Analgesic Self-Medication among Medical Students

Analgesic self-medication in past month	Frequency (n)	Percentage (%)
Yes	238	58.9
No	166	41.1
Total	404	100.0

In students who reported using analgesics for self-medication, the predominant sleep quality reported was "fairly good sleep" (125 students 52.5%). Very good sleep was reported by 59 students (24.8%), fairly bad sleep by 35 students (14.7%) and very bad sleep by 19 students (8.0%). Among the students who did not take analgesics without a prescription, 75 students (45.2%) reported fairly good sleep, 52 students (31.3%) reported very good sleep, 27 students (16.3%) reported fairly bad sleep and 12 students (7.2%) reported very bad sleep.

Table 2. Association Between Analgesic Self-Medication and Sleep Quality

Sleep quality	Analgesic self-medication Yes n (%)	Analgesic self-medication No n (%)	Total n (%)
Very good	59 (24.8)	52 (31.3)	111 (27.5)
Fairly good	125 (52.5)	75 (45.2)	200 (49.5)
Fairly bad	35 (14.7)	27 (16.3)	62 (15.3)
Very bad	19 (8.0)	12 (7.2)	31 (7.7)
Total	238 (100.0)	166 (100.0)	404 (100.0)

No statistically significant relationships were observed between medical student self-medicating with analgesics and sleep quality, as determined by the chi-square test ($\chi^2 = 2.812$, df = 3, $p = 0.422$). Poor sleep quality (fairly bad and very bad sleep) was reported by both groups, but not significantly different between students who took analgesics without prescription and students who did not.

Table 3. Good and Poor Sleep Quality According to Analgesic Self-Medication

Sleep quality category	Analgesic self-medication Yes n (%)	Analgesic self-medication No n (%)	Total n (%)
Good sleep quality	184 (77.3)	127 (76.5)	311 (77.0)
Poor sleep quality	54 (22.7)	39 (23.5)	93 (23.0)
Total	238 (100.0)	166 (100.0)	404 (100.0)

A similar pattern was seen when sleep quality was categorized as good sleep quality versus poor sleep quality. Among the students who use analgesics, 184 (77.3%) reported good sleep quality while 127 (76.5%) of those who do not use analgesics reported good sleep quality. A total of 54 students (22.7%) and 39 students (23.5%) of the users and non-users respectively reported poor sleep quality. These results suggest that there was not much difference in poor sleep between both groups. The overall prevalence rate of self-medication with analgesics among medical students was high in Peshawar, but in the current study, the association between self-medication with analgesics and sleep quality was not statistically significant. The results indicate that other academic, psychological, behavioral, or lifestyle factors might affect sleep quality among medical students, in addition to the use of analgesics for self-medication.

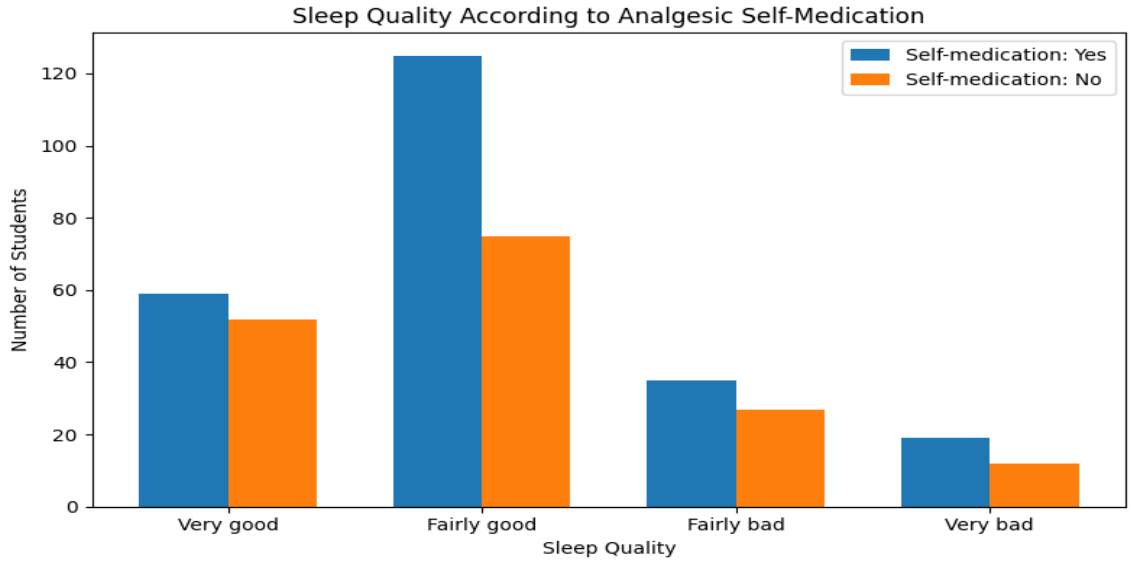

Figure 1. Sleep Quality According to Analgesic Self-Medication among Medical Students

The graph shows that **fairly good sleep quality** was the most commonly reported category in both groups, while **very bad sleep quality** was least reported among students with and without analgesic self-medication.

DISCUSSION

The current study evaluated the use of self-medication as a form of pain medication and its impact on sleep quality among medical students in Peshawar. Of the 238 students who said they used analgesics without a prescription (58.9%), 166 students (41.1%) did not report self-medicating with analgesics in the past month. The results revealed that the use of self-medication with analgesics is prevalent among medical students. The high frequency can be attributed to the ease of availability of medicines, basic knowledge of pharmacology, heavy academic workload, peer pressure and the belief that common complaints like headache, bodyache, fever, and menstrual pain are not always a necessity to consult with a doctor. These patterns are also evident in the latest Pakistani literature. A high self-medication rate was reported by Ameer et al. in medical students of Lahore, as 68.5% of the students were self-medicating, acetaminophen was the most commonly self-medicated analgesic and headache was the most common indication for self-medication (11).

Although the current study yielded a slightly lower rate of self-medication with analgesics, the figures in the study are still alarming. This difference in prevalence could be due to differences in study setting, year distribution, sample characteristics, access to medicines and differences in students' perception of the severity of the illness. Also, in the Lahore study, many students indicated that the illness was not serious enough to seek medical advice, confirming that medical students may think of taking analgesics as a regular and safe practice (11). This is because all commonly used analgesics may produce detrimental side effects if taken repeatedly or without appropriate supervision such as gastrointestinal irritation, renal effects, hepatotoxicity with excessive Paracetamol use and masking of underlying disease (12).

In the present study, the sleep quality of the students who self-medicated with analgesics and the students who did not were compared. Of the students who used self-medication as analgesics, 59 students (24.8%) reported very good sleep, 125 students (52.5%) reported fairly good sleep, 35 students (14.7%) reported fairly bad sleep, and 19 students (8.0%) reported very bad sleep. Of the non-users, 52 students (31.3%) reported very good sleep, 75 (45.2%) fairly good sleep, 27 (16.3%) fairly bad sleep, and 12 (7.2%) very bad sleep. There were some slight variations between the two groups, but the general trend was the same. There was no statistically significant relationship between the use of analgesics for self-medication and sleep quality ($p = 0.422$) in the chi-square test. This indicates that the quality of sleep among medical students in this sample may not be primarily influenced by the use of analgesics for self-medication (13).

The findings of this study may not be because of the single behavior, as there are many factors that affect the quality of sleep of medical students. Stress at school, pressure of examination, excessive use of screens, irregular sleeping habits, over-indulgence in caffeine, the lifestyle of a hostel, anxiety, and workload can all impact sleep quality. It was reported by Ijaz et al that Pakistani medical students have a high prevalence of poor sleep quality and that there was a significant correlation between sleep quality and academic stress which indicated that stress could be more important than behavior related to medication to cause poor sleep quality (14). Likewise, Tran et al. noted that sleep quality and stress are closely associated

among medical students, which implies that psychological and academic stress should be taken into account when exploring sleep-related outcomes (15).

The results of this study also contradict some previous studies that showed a strong relationship between analgesics self-medication and sleep problems. The study by Kumar et al. revealed that there was a strong correlation between poor sleep quality and the self-medication of analgesics among medical undergraduates (16). This difference could be attributed to differences in measurement instruments, sample size, population characteristics, frequency/duration of use of the analgesics, and the quality of sleep measurement (either from a detailed sleep scale like the Pittsburgh Sleep Quality Index or a single item self-reported sleep quality question). This study used four subjective sleep categories, potentially limiting the sensitivity to detect subtle sleep disturbances.

Recent studies in Pakistan have indicated that medical students are not sleeping well, even if not directly associated with the practice of self-medication. Hasmain et al. found that 78.2% of medical students in a private medical college in Lahore had poor sleep quality and sleep-related variables like sleep duration, sleep medication use and daytime dysfunction were associated with academic year (17). A further study in 2024 with medical and dental students revealed that over 50% of the students had poor sleep, which is an important student health issue (18). According to these results, sleep problems are common among medical students and may not be associated with the use of analgesics for self-medication (19).

In the current study, most students in both groups indicated good (or fairly good) sleep quality. A total of 77.3% of the self-medication users and 76.5% of non-users said they slept well, with 22.7% and 23.5% reporting poor sleep quality, respectively. This clustering also reinforces the fact that there is no significant relation between self-medication with analgesics and sleep quality. But, for this reason, self-medication with analgesics is not without risk. Instead, it suggests that the quality of sleep in this study population was not significantly different based on analgesic self-medication status.

The study has significant public health and academic implications. Medical students are future prescribers and their attitudes towards self-medication can affect their future clinical attitudes. The high rates of self-medication with analgesics indicate the need for educational sessions on rational drug use, adverse drug reactions, safe dosage of analgesics and the risks of repeated use of OTC drugs. Counselling services for students, stress management programmes, sleep hygiene education and academic support should also be provided to improve sleep health. In the present study, there was no significant association between the analgesic self-medication and sleep quality, so further studies should be conducted with the addition of other variables like stress level, amount of caffeine consumed, amount of screen time, physical activity, academic year, hostel residence, how often they take analgesics and what type of analgesics they take.

There were some limitations in this study. Firstly, the cross-sectional design does not permit draw cause and effect conclusions. Second, the data were self-reported, potentially introducing recall bias and/or reporting bias. Third, sleep quality was measured subjectively, and a more detailed assessment could be done with a validated instrument like the Pittsburgh Sleep Quality Index. The Urdu version of PSQI has been validated and found reliable to measure sleep quality among Urdu speakers (20). However, the findings of this study are locally valuable in this regard that medical students of Peshawar are self-medicating with analgesics and their sleep quality is not good.

CONCLUSION

Analgesic self-medication was common among medical students in Peshawar, with more than half of the participants reporting use of analgesics without a proper prescription. However, the study found no statistically significant **association** between analgesic self-medication and sleep quality. Good sleep quality was reported by a similar proportion of students in both self-medication and non-self-medication groups. These findings suggest that sleep quality among medical students may be influenced more by other factors such as academic stress, workload, lifestyle habits, screen use, and psychological well-being rather than analgesic self-medication alone. Educational interventions should focus on both rational analgesic use and promotion of healthy sleep practices among medical students.

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